

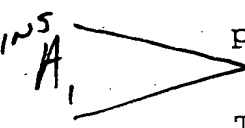
Box for set of electric storage batteriesBRIEF DESCRIPTION OF THE INVENTION

The present invention relates to a box for a set of electric storage batteries, particularly for an electric self-propelled vehicle, such as a maintenance machine and is particularly suitable for receiving batteries consisting of sealed elements of the gas re-combination type.

DESCRIPTION OF THE RELATED ART

10 As is conventional, the power source used for electric vehicles is an assembly of batteries, each capable of delivering a voltage of the order of, for example, 2 volts. These batteries are placed in series or in parallel in a case placed in a housing provided for  
15 this purpose in the vehicle.

As will be appreciated, in order to reduce the number of battery charging and discharging cycles and so increase their life, a large number of batteries must  
20 be carried in order for there to be sufficient electric power available.

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The object of the invention is to provide a battery box capable of containing a large number of electric  
25 storage batteries within a small space.

Its subject is therefore a box for a set of electric storage batteries comprising at least two side walls extending generally parallel and defining between  
30 themselves a housing for receiving the batteries, the box being characterized in that the side walls consist of an assembly of stacked elementary modules each comprising a pair of wall elements mounted opposite each other.

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In this way the overall volume of the box is adapted to the number of batteries carried, so that the amount of unoccupied free space is reduced.

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The box according to the invention may also comprise one or more of the following characteristics, taken in isolation or in accordance with all technically possible combinations:

- each wall element is in the form of a profile and comprises at least one folded edge that defines, jointly with a folded edge of the wall element mounted opposite it, a support for at least one row of batteries;
- it also comprises battery retention means;
- the retention means comprise a removable rod extending through the folded edges of the stacked wall elements;
- it also comprises two end plates, each provided with fixing lugs for the wall elements;
- the end plates are provided with openings for the ventilation of the battery elements;
- the end plates are each provided with a handling point for engagement by a lifting appliance.

The invention also relates to a system of boxes for a set of electric storage batteries characterized in that it consists of a set of boxes as defined above.

#### 25 BRIEF DESCRIPTION OF THE DRAWINGS

Other characteristics and advantages will become clear in the course of the description, which is given purely by way of example and with reference to the accompanying drawings, in which:

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- Figure 1 is an exploded perspective view of a box in accordance with the invention; and
- Figure 2 is a perspective view of a module used in the construction of the box shown in Figure 1.

#### 35 DESCRIPTION OF THE PREFERRED EMBODIMENTS

Figure 1 shows a battery box for an electric self-propelled vehicle, denoted by the general reference number 10 and positioned in what would be

assumed to be a vertical position.

It is intended to receive a set of electric storage batteries, particularly sealed elements of the gas-recombination type, and to be placed in a housing provided for this purpose in a vehicle so as to serve as a source of electric motive power.

The box 10 comprises two side walls 12 and 14 spaced apart and defining between themselves a housing in which the batteries are placed. For example, each battery is capable of delivering a voltage of the order of 2 volts.

With reference also to Figure 2, the side walls 12 and 14 are made up of an assembly of elementary interchangeable stacked modules, such as 16. The number of modules used depends on the number of batteries to be carried.

Each module 16 comprises a pair of wall elements 18 and 20 arranged opposite each other in the assembled condition.

Each wall element is in the form of a U section whose arms 22 and 24 point inwards into the housing and permit stacking of the wall elements on top of each other while its base 26 is designed to form after assembly, and jointly with the other wall elements of the stack, the side wall proper of the box 10.

More specifically, in the assembled condition, the lower arms 24 of the opposing wall elements 18 and 20 together form a support designed to receive one or more rows of electric storage batteries, these batteries being connected in series or in parallel.

Referring once again to Figure 1, the box 10 also

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includes two end plates 28 and 30 attached to the free ends of the case composed of the assembled modules 16. At least one end plate is attached removably for the batteries to be placed in or removed from the box 10.

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More specifically, each end plate 28 and 30 is provided with fixing lugs, such as 32, arranged in pairs with one elementary module 16 attached to each lug.

10 It will be seen that the dimensions of the end plates 28 and 30 are such as to space the wall elements 18 and 20 of each module 16 in such a way that the ends of the edges 24 are spaced apart by a distance shorter than the length or width of the batteries.

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The end plates 28 and 30 are also provided with openings such as 34, to allow ventilation of the batteries placed in the box 10, and with a handling point 36 designed to engage with a lifting appliance

20 for raising the composite battery and setting it down.

Lastly, Figure 1 shows that the box 10 is completed by means of retention of the battery elements, in the form of a rod 38 inserted into orifices 40 (Figure 2) formed  
25 in the folded edges 22 and 24 of the wall elements.

Other kinds of appropriate means of retention can of course be envisaged.

30 In the description of the invention, it has been assumed that the wall elements are in the form of U sections.

It would however be possible, as a variant, to equip  
35 the box with modules having wall elements shaped differently e.g. in I sections, particularly in order to make a system of boxes by linking different boxes together.

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It will be realized that the battery box according to the invention, as described above, which uses a set of interchangeable modules, enables the total volume to be adapted to the number of batteries it contains and therefore enables its volume to be reduced in the sense that the amount of unoccupied space can in this way be limited.

Should it be wished to increase the number of batteries carried, either longer modules should be used and the same end plates retained, or the number of stacked modules should be increased, and the box provided with higher end plates as a consequence.

If it is wished to provide a power source of very large capacity, it is possible to produce a system of boxes formed of an assembly of several boxes built as described earlier, in which the batteries are connected in series or parallel. In this arrangement, one or more modules may be common to all the boxes.

Furthermore, the edges of the wall elements allow a space to be defined between the racks of batteries which, in conjunction with the openings formed in the side plates, allows for cooling of the battery elements by ventilation.

It will be noted too that the invention greatly facilitates the operations of assembling and disassembling the batteries, in that all that is required is simply to take off one of the side plates and if necessary to remove the retention rod to enable battery elements to be inserted or removed.

Finally, it will be noted that the invention described above greatly facilitates the operations of battery maintenance, as the ventilation openings allow access

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to the battery elements. It is thus possible to measure the voltage available at the terminals of the battery elements without having to dismantle the box.

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